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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,356	10/10/2003	David E. Rhodes	SON-05-1376R	3196

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EXAMINER	
DANIELS, MATTHEW J	

ART UNIT	PAPER NUMBER
1732	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	**Application No.** 10/684,356	**Applicant(s)** RHODES ET AL.	
	Examiner Matthew J. Daniels	**Art Unit** 1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 February 2007*.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9,16-22 and 24-32* is/are pending in the application.
4a) Of the above claim(s) *16-22* is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-9 and 24-32* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a)☐ All b)☐ Some * c)☐ None of:
1.☐ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date *2/16/07, 3/29/07*.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 16 February 2007 has been entered. Claims 31 and 32 are new, Claims 1, 4, and 24 are amended.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Rejections set forth previously under this section are withdrawn in view of the amendment to "consisting essentially of" in Claim 1. The reference applied previously required additional agents falling outside the scope of the transitional language now recited by this claim.

3. **Claims 1-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Knudsen (WO 99/01276) in view of Carter (USPN 2078836) and Russell (USPN 38267036). **As to Claim 1**, Knudsen teaches a method of forming fibrous webs, comprising:

Providing an activatable adhesive (page 8, Claim 9);

Coating the activatable adhesive onto a fibrous substrate (page 7, Claim 1, step b.)

Drying the coated substrate to reduce moisture and provide a non-activated state (page 4, lines 7-8);

Forming the activatable web into the shape of an article (Fig. 2);

Activating the adhesive by heating with electromagnetic energy (page 8, Claim 9).

Knudsen is silent to (a) the activatable adhesive consisting essentially of sodium silicate and a dielectric reducing agent, (b) activating with microwave energy, (c) the order of steps of activating and forming into a shape, and (d) the dielectric reducing agent reducing the effect of microwave energy on the sodium silicate and the heating of the moisture retained in within the web solubilizes the adhesive to activate the adhesive.

However, these aspects of the invention would have been prima facie obvious over Carter and Russell for the following reasons:

(a) Carter teaches a adhesive consisting essentially of sodium silicate and a dielectric reducing agent (the claimed sugar of Claim 4, see Carter, page 2, left col., lines 9-23).

(b) Knudsen suggests activating with "electromagnetic radiation" (Claim 9), but is silent to the type of electromagnetic radiation. However, Russell teaches that it is known to activate adhesives, particularly sodium silicate adhesives (5:45-50) with electromagnetic dielectric radiation (9:51-57) in the form of microwave energy (10:69-73).

(c) Rearrangement of the order of steps is generally considered to be prima facie obvious in the absence of unexpected results. *Ex parte Rubin*, 128 USPQ 440 (Bd. App. 1959) (Prior art reference disclosing a process of making a laminated sheet wherein a base sheet is first coated with a metallic film and thereafter impregnated with a thermosetting material was held to render prima facie obvious claims directed to a process of making a laminated sheet by reversing the order of the prior art process steps.). Here, *Rubin* is particularly relevant because it provides guidance regarding assembly, as claimed. Also note Knudsen's teachings on page 4, lines 22-25, which appears to teach the order claimed.

(d) The solubilization and other claimed effects would have been inherent in the combination in that Carter provides the claimed sodium silicate adhesive, Russell teaches dielectric (9:55) microwave (10:70) of sodium silicate adhesives on paper (cols. 1-2) and Knudsen suggests activating the adhesive on paper with electromagnetic radiation (Claim 9).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the methods Carter and Russell into that of Knudsen for the following reasons:

(a) Knudsen suggests the type of adhesive normally used for sealing cardboard boxes (paragraph bridging pages 3 and 4) which would be made of paper or paper-type material, and Carter provides an adhesive directed at paper (page 1, left col., lines 9-17) which would provide the bonding action and substrate suggested by Knudsen. Additionally, Russell would motivate the combination of Carter with Knudsen because Russell teaches that sodium silicate (as also used by Carter) is a useful adhesive for "round" boxes (1:18-21 and 2:1-38) (which is the type of article fabricated by Knudsen). Also note Russell's suggestion to use a sodium silicate adhesive on paper with a "mandrel" (1:23), which appears to be substantially similar to the method of Knudsen (Figs.), further motivating the combination.

(b) Knudsen suggests electromagnetic radiation to activate adhesive (Claim 9) and Russell's dielectric microwave heating provides a very high heating rate in the interior of the paper (10:63-70) which would increase the uniformity and speed of the heating.

As to Claims 2-3, Russell teaches that the step of drying (cols. 5-6). In particular, Russell teaches that as water content is reduced, plastic flow properties change in relation thereto (6:1-5). The plastic flow properties are required in the shaping and operation (9:50-60). Thus, the particular amount of water represents a result effective variable that is optimizable. See MPEP 2144.05 II and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to optimize the amount of water based on the plastic flow properties and arrive at the claimed invention. **As to Claim 4**, Carter teaches the same or substantially the same composition as claimed (page 2, left col., lines 10-25 and 50-65). **As to Claims 5 and 6**, Knudsen provides the claimed winding of a coated substrate around a mandrel, overlapping to form a tube (Fig. 2). **As to Claim 7**, Knudsen suggests that the activating unit may be placed downstream from the winding on point, along the mandrel (page 4, lines 22-25). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to provide a mandrel comprising an electromagnetic energy transparent mandrel in order to heat only the web. In the combined method where Russell suggests the dielectric microwave heating, it would have been desirable to provide a mandrel which was invisible to the microwaves in order to provide rapid even heating of only the shaped tubular material. **As to Claim 8**, Knudsen teaches that the forming step comprises assembly of multiple substrates (page 5, lines 1-6) formed together into a hybrid. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to select or change the placement of the layers and adhesive in order to adjust the properties or strength of the composite material. **As to Claim 9**, Carter teaches glycerin optionally used in the mixture (page 2, right col., lines 30-65), which would implicitly provide a surface coating which retards drying (lines 39-40). Although the order of steps is different (mixing into adhesive versus coating after application of adhesive), this is interpreted to be a difference in the order of steps which does not provide a materially different effect or unexpected result.

4. **Claims 24-26, 29-32** are rejected under 35 U.S.C. 103(a) as being unpatentable over Russell (USPN 38267036) and Carter (USPN 2078836). **As to Claim 24**, Russell teaches a method of forming articles from a fibrous substrate comprising:

Providing a fibrous substrate (2:1-20, especially paper, 2:13);

Providing a wet slurry containing sodium silicate;

Applying the wet slurry to a fibrous substrate to form a coated substrate (Fig. 1) having latent water therein (6:1-5);

Drying the coated substrate (Fig. 1, Drying Oven);

Exposing the coated substrate to dielectric energy (9:50-60) comprising microwave energy (10:70), thereby heating the latent water in the coated substrate, activating the adhesive properties of the sodium silicate (implicit in 9:50-60);

Forming the coated substrate into the shape of an article (9:50-60, 1:15-25).

Russell is silent to the "consisting essentially of sodium silicate and a dielectric reducing agent" and the partially dissolving recited in the last step.

However, Carter teaches adding sugar (a dielectric reducing agent, see instant Claim 30) to sodium silicate, the adhesive consisting essentially of sodium silicate and sugar (page 2, left col., lines 10-20). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Carter into that of Russell in order to improve the toughness of the sodium silicate (page 2, left col., lines 65-66) and change the viscosity (page 2, left col., lines 15-23) which would change its application and setting characteristics. **As to Claims 25 and 30**, See Carter, page 2, left col, line 17 for "sugar". **As to Claim 26,** Russell teaches that the step of drying (cols. 5-6). In particular, Russell teaches that as water content is reduced, plastic flow properties change in relation thereto (6:1-5). The plastic flow properties are required in the shaping and operation (9:50-60). Thus, the particular amount of water represents a result effective variable that is optimizable. See MPEP 2144.05 II and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to optimize the amount of water based on the plastic flow properties and arrive at the claimed invention. **As to Claim 29**, Russell teaches laminating under heat and pressure (1:20-25), and further that the sheets are in contact prior to flow of the adhesive (1:45-60), thus forming occurs prior to activating. Alternatively, it is generally considered prima facie obvious to rearrange process steps. See *Rubin*, above.

As to Claims 31 and 32, Russell teaches a method of forming articles from fibrous webs:

Providing a wet slurry comprising sodium silicate (2:20-35);

Coating the wet slurry onto a fibrous substrate (Fig. 1);

Drying the coated substrate to reduce the moisture content to form an activatable adhesive in a non-activated state (Fig. 1, drying oven, 1:45-55);

Forming the activatable web into the shape of an article (1:20-25, 1:45-55, 9:50-60); and

Heating moisture retained within the fibrous substrate with dielectric energy (9:50-60) in the form of microwaves (10:65-75) activates the adhesive (9:50-60).

Russell is silent to the sugar dielectric reducing agent.

However, Carter teaches adding sugar (a dielectric reducing agent, see instant Claim 30) to sodium silicate, the adhesive comprising or consisting essentially of sodium silicate and sugar (page 2, left col., lines 10-20). The sugar of Carter would implicitly reduce the effect of the microwave energy of Russell in the manner claimed. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Carter into that of Russell in order to improve the toughness of the sodium silicate (page 2, left col., lines 65-66) and change the viscosity (page 2, left col., lines 15-23) which would change its application and setting characteristics.

5. **Claims 27 and 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Russell (USPN 38267036) and Carter (USPN 2078836), and further in view of Knudsen (WO 99/01276). Russell and Carter teach the subject matter of Claim 24 above under 35 USC 103(a). As to Claims 27 and 28, Russell teaches a mandrel (1:22-25) and forming round products (1:18-20), but Russell is silent to the winding to form a tube around a mandrel. However, Knudsen teaches winding a coated substrate around a mandrel to form a tube (Fig. 2). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Knudsen into that of Russell in view of Russell's suggestion to use a mandrel and to form round or tubular structures (1:15-25).

Response to Arguments

6. Applicant's arguments with respect to the Murayama reference have been considered but are moot in view of the new ground(s) of rejection. In the new rejections, Knudsen teaches the claimed shaping methods with a conventional adhesive. Russell teaches a sodium silicate adhesive on paper and various shaping processes, and Carter further provides that it is known to add sugar to a sodium silicate adhesive in order to provide various desirable properties. The new rejections above are believed to fully address all arguments filed 16 February 2007.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Matthew J. Daniels

A.U. 1732

26 April 2007